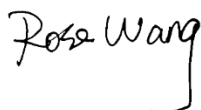


RF Exposure Evaluation Report

APPLICANT : Quectel Wireless Solutions Co., Ltd.
EQUIPMENT : LTE-A Cat 18 LGA Module
BRAND NAME : Quectel
MODEL NAME : EG18-NA
FCC ID : XMR202002EG18NA
STANDARD : 47 CFR Part 2.1091
FCC KDB 447498 D01 v06

We, Sporton International (Kunshan) Inc., would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091 and FCC KDB 447498 D01 v06, and pass the limit. Without written approval of Sporton International (Kunshan) Inc., the test report shall not be reproduced except in full.



Reviewed by: Rose Wang / Supervisor



Approved by: Kat Yin / Manager



Sporton International (Kunshan) Inc.

No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province
215300 People's Republic of China



Table of Contents

1. ADMINISTRATION DATA	4
1.1. Testing Laboratory	4
2. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)	5
3. MAXIMUM RF AVERAGE OUTPUT POWER AMONG PRODUCTION UNITS	6
4. RF EXPOSURE LIMIT INTRODUCTION	7
5. RADIO FREQUENCY RADIATION EXPOSURE EVALUATION	8
5.1. Standalone Power Density Calculation	8
5.2. Collocated Power Density Calculation.....	9

**Revision History**

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA9N1414	Rev. 01	Initial issue of report	Apr. 01, 2020



1. Administration Data

1.1. Testing Laboratory

Sporton International (Kunshan) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Testing Laboratory		
Test Firm	Sporton International (Kunshan) Inc.	
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958	
Test Site No.	FCC Designation No.	FCC Test Firm Registration No.
	CN1257	314309

Applicant	
Company Name	Quectel Wireless Solutions Co., Ltd.
Address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

Manufacturer	
Company Name	Quectel Wireless Solutions Co., Ltd.
Address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	LTE-A Cat 18 LGA Module
Brand Name	Quectel
Model Name	EG18-NA
IMEI	IMEI 1:355379058091074 IMEI 2:355379058096578
FCC ID	XMR202002EG18NA
Wireless Technology and Frequency Range	WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 13: 779.5 MHz ~ 784.5 MHz LTE Band 14: 790.5 MHz ~ 795.5 MHz LTE Band 25: 1850.7 MHz ~ 1914.3 MHz LTE Band 26: 814.7 MHz ~ 848.3 MHz LTE Band 30: 2307.5 MHz ~ 2312.5 MHz LTE Band 41: 2498.5 MHz ~ 2687.5 MHz LTE Band 66: 1710.7 MHz ~ 1779.3 MHz LTE Band 71: 665.5 MHz ~695.5 MHz
Mode	AMR/RMC 12.2Kbps HSDPA HSUPA DC-HSDPA DC-HSUPA HSPA+ (16QAM uplink is not supported) LTE: QPSK, 16QAM, 64QAM
HW Version	R1.0
SW Version	EG18NAPAR01A04M4G
EUT Stage	Identical Prototype

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.



3. Maximum RF average output power among production units

<WCDMA>

Mode		Maximum Average power(dBm)
WCDMA	Band II	24.00
	Band IV	24.00
	Band V	24.00

<LTE>

Mode		Maximum Average power(dBm)
LTE	Band 2	24.00
	Band 4	24.50
	Band 5	24.00
	Band 7	24.50
	Band 12	24.00
	Band 13	24.00
	Band 14	24.00
	Band 25	24.00
	Band 26	24.00
	Band 30	24.00
	Band 41	24.50
	Band66	24.50
	Band71	24.50

4. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna

5. Radio Frequency Radiation Exposure Evaluation

5.1. Standalone Power Density Calculation

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Average EIRP (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)
WCDMA Band 2	1852.4	9.0	24.00	33.000	1995.262	0.397	1.000
WCDMA Band 4	1712.4	5.5	24.00	29.500	891.251	0.177	1.000
WCDMA Band 5	826.4	7.0	24.00	31.000	1258.925	0.251	0.551
LTE Band 2	1850.7	9.0	24.00	33.000	1995.262	0.397	1.000
LTE Band 4	1710.7	5.5	24.50	30.000	1000.000	0.199	1.000
LTE Band 5	824.7	7.0	24.00	31.000	1258.925	0.251	0.550
LTE Band 7	2502.5	8.0	24.50	32.500	1778.279	0.354	1.000
LTE Band 12	699.7	5.5	24.00	29.500	891.251	0.177	0.466
LTE Band 13	779.5	5.5	24.00	29.500	891.251	0.177	0.520
LTE Band 14	790.5	5.5	24.00	29.500	891.251	0.177	0.527
LTE Band 25	1850.7	9.0	24.00	33.000	1995.262	0.397	1.000
LTE Band 26	814.7	7.0	24.00	31.000	1258.925	0.251	0.543
LTE Band 30	2307.5	6.0	24.00	30.000	1000.000	0.199	1.000
LTE Band 41	2498.5	8.0	24.50	32.500	1778.279	0.354	1.000
LTE Band 66	1710.7	5.5	24.50	30.000	1000.000	0.199	1.000
LTE Band 71	665.5	5.5	24.50	30.000	1000.000	0.199	0.444

Note: For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.

5.2. Collocated Power Density Calculation

General Note:

1. This MPE analysis is applicable to any collocated transmitters with EIRP for WLAN is less than or equal to 28.0dBm and EIRP for Bluetooth is less than or equal to 20.0dBm.
2. A maximum antenna gain of 8dBi for WLAN / Bluetooth has been assumed for all collocated antennas.

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Average EIRP (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Power Density / Limit
WCDMA Band 2	1852.4	8.0	24.00	32.0	1584.89	0.315	1.000	0.315
WCDMA Band 4	1712.4	5.5	24.00	29.5	891.25	0.177	1.000	0.177
WCDMA Band 5	826.4	6.0	24.00	30.0	1000.00	0.199	0.551	0.361
LTE Band 2	1850.7	8.0	24.00	32.0	1584.89	0.315	1.000	0.315
LTE Band 4	1710.7	5.5	24.50	30.0	1000.00	0.199	1.000	0.199
LTE Band 5	824.7	6.0	24.00	30.0	1000.00	0.199	0.550	0.362
LTE Band 7	2502.5	8.0	24.50	32.5	1778.28	0.354	1.000	0.354
LTE Band 12	699.7	5.5	24.00	29.5	891.25	0.177	0.466	0.380
LTE Band 13	779.5	5.5	24.00	29.5	891.25	0.177	0.520	0.341
LTE Band 14	790.5	5.5	24.00	29.5	891.25	0.177	0.527	0.337
LTE Band 25	1850.7	8.0	24.00	32.0	1584.89	0.315	1.000	0.315
LTE Band 26	814.7	6.0	24.00	30.0	1000.00	0.199	0.543	0.366
LTE Band 30	2307.5	5.0	24.00	29.0	794.33	0.158	1.000	0.158
LTE Band 41	2498.5	7.0	24.50	31.5	1412.54	0.281	1.000	0.281
LTE Band 66	1710.7	5.5	24.50	30.0	1000.00	0.199	1.000	0.199
LTE Band 71	665.5	5.0	24.50	29.5	891.25	0.177	0.444	0.400
WLAN2.4GHz Band	2412	5.0	15.00	20.0	100.00	0.020	1.000	0.020
WLAN5GHz Band	5180	8.0	20.00	28.0	630.96	0.126	1.000	0.126
Bluetooth	2402	5.0	15.00	20.0	100.00	0.020	1.000	0.020

WWAN Power Density / Limit	WLAN Power Density / Limit	Bluetooth Power Density / Limit	Σ(Power Density / Limit) of WWAN + WLAN + Bluetooth
0.400	0.126	0.020	0.546

Note:

1. For collocation analysis, LTE Band 71 is chosen for summation due to the highest (power density/limit) among all WWAN wireless modes.
2. Σ(Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WWAN + WLAN + Bluetooth.
3. Considering the WWAN module collocation with the WLAN and Bluetooth transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 3 collocated transmitters is compliant.

**Conclusion:**

Based on 47 CFR §2.1091 and FCC KDB 447498 D01 v06, the analysis concludes that this product when transmitting in standalone within a host device, is compliant with the FCC RF exposure requirements in mobile exposure condition, provided the conducted power and antenna gain do not exceed the limits for each given frequency band per wireless technology as follow table:

Device	Band	Frequency (MHz)	Maximum Conducted Power (dBm)	Standalone Maximum Antenna Gain (dBi)	Collocated Maximum Antenna Gain (dBi)
EG18-NA	WCDMA Band 2	1852.4	24.00	9.0	8.0
	WCDMA Band 4	1712.4	24.00	5.5	5.5
	WCDMA Band 5	826.4	24.00	7.0	6.0
	LTE Band 2	1850.7	24.00	9.0	8.0
	LTE Band 4	1710.7	24.50	5.5	5.5
	LTE Band 5	824.7	24.00	7.0	6.0
	LTE Band 7	2502.5	24.50	8.0	8.0
	LTE Band 12	699.7	24.00	5.5	5.5
	LTE Band 13	779.5	24.00	5.5	5.5
	LTE Band 14	790.5	24.00	5.5	5.5
	LTE Band 25	1850.7	24.00	9.0	8.0
	LTE Band 26	814.7	24.00	7.0	6.0
	LTE Band 30	2307.5	24.00	6.0	5.0
	LTE Band 41	2498.5	24.50	8.0	7.0
	LTE Band 66	1710.7	24.50	5.5	5.5
	LTE Band 71	665.5	24.50	5.5	5.0
Collocated Transmitters	WLAN2.4GHz	2412	15.00		5.0
	WLAN5GHz	5180	20.00		8.0
	Bluetooth	2402	15.00		5.0

-----THE END-----